4. GENERAL PROTECTION/COLLECTION STRATEGIES

4.1. Chapter Overview

This chapter details the specific response strategies and resources to protect as outlined by the participants of the GRP workshop for the Strait of Juan de Fuca area. It describes the strategies determined for each area and the prioritization of those strategies. Note that GRPs only address protection of sensitive **public** resources. It is the responsibility of private resource owners and/or potentially liable parties to address protection of private resources (such as commercial marinas, private water intakes, and non-release aquaculture facilities).

Maps & Matrices

The maps in this chapter provide information on the specific location of booming strategies. They are designed to help the responder visualize response strategies. Details of each booming strategy are listed in corresponding matrix tables. Each matrix indicates the exact location, intent and implementation of the strategy indicated on the map. The "Status" column describes whether the strategy has been visited or tested in the field, and the date of the visit/test. Most strategies include a number for the corresponding shoreline photo, which is available on the Washington Department of Ecology's internet site at http://www.ecy.wa.gov/apps/shorephotos/.

Major Protection Techniques

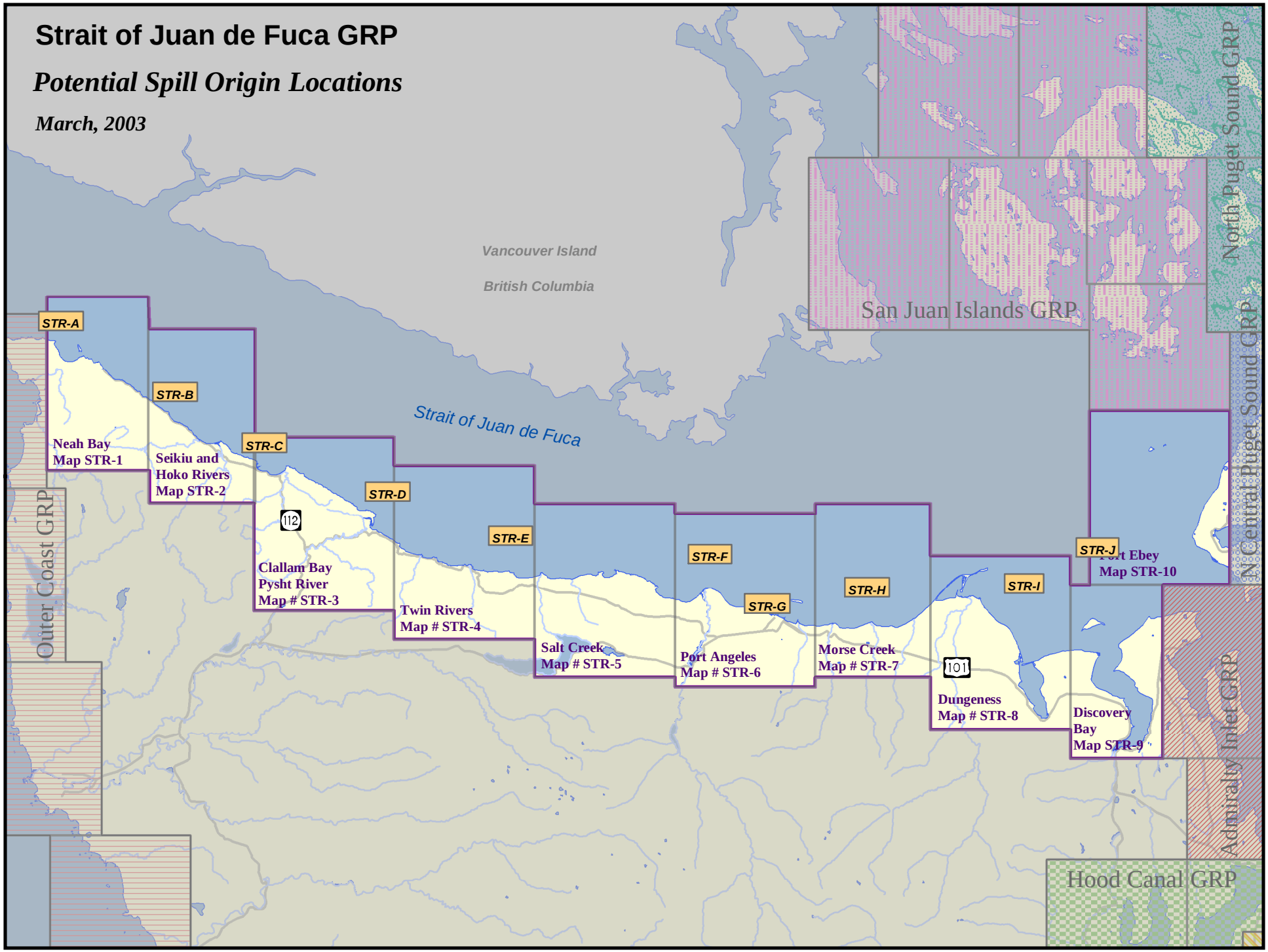
All response strategies fall into one of three major techniques that may be utilized either individually or in combination. The strategies listed in Section 4.2 are based on the following techniques, and are explained in detail in Section 4.3:

Dispersants: Washington State Policy currently does not allow use of dispersants in this area. Certain chemicals break up slicks on the water. Dispersants can decrease the severity of a spill by speeding the dissipation of certain oil types. Their use will require approval of the Unified Command. Dispersants will only be used in offshore situations under certain conditions, until further determinations are made by the Area Committee and published in the Area Contingency Plan.

In Situ Burning: Approval to burn in this area is unlikely due to the proximity of population to a potential burn site. Burning requires the authorization of the Unified Command, who determine conformance of a request to burn with the guidelines set forth in the Area Plan. This option is preferable to allowing a slick to reach the shore provided that population areas are not exposed to excessive smoke. Under the right atmospheric conditions, a burn can be safely conducted in relative close proximity to human population. This method works on many types of oil, and requires special equipment including a fire boom and igniters.

Mechanical Recovery and Protection Strategies: If a spill is too close to shore to use In Situ burning or dispersants, the key strategies are skimming and use of collection, diversion, or exclusion booming to contain and recover the oil, and prevent it from entering areas with sensitive wildlife and fisheries resources. These options are described in detail in Appendix A. Specific skimming strategies are not listed in the maps and matrices, but skimming should be used whenever possible and is often the primary means of recovering oil and protecting resources, especially when booming is not possible or feasible.

Priorities: The strategy priority tables (Section 4.2.) were developed using specific locations where spills are likely to occur. Trajectory modeling was used for each of these "Potential Spill Origins" to identify sensitive resources that would likely be impacted within the initial hours of the spill. A booming strategy priority table was developed for each of the "Potential Spill Origins" based on the sensitivity of resources, feasibility, etc. **Booming strategies should be deployed following the priority table for the "Potential Spill Origin" closest to the actual spill origin.** The map on page 4-2 shows the locations of all Potential Spill Origins for the Strait of Juan de Fuca GRP. The booming strategies indicated in the priority tables are explained in detail in the Maps & Matrices section (Section 4.3.). It is implied that control and containment at the source is the number one priority of any response. If in the responder's best judgment this is not feasible, then the priorities laid out in the priority tables take precedence over containment and control.


Strait of Juan de Fuca GRP
Potential Spill Origin Locations
March, 2003
Vancouver Island
British Columbia
Strait of Juan de Fuca
San Juan Islands GRP
North Puget Sound GRP
N Central Puget Sound GRP
Admiralty Inlet GRP
Hood Canal GRP
Outer Coast GRP
STR-A
STR-B
STR-C
STR-D
STR-E
STR-F
STR-G
STR-H
STR-I
STR-J
Neah Bay
Map STR-1
Seikiu and
Hoko Rivers
Map STR-2
Clallam Bay
Pysht River
Map # STR-3
Twin Rivers
Map # STR-4
Salt Creek
Map # STR-5
Port Angeles
Map # STR-6
Morse Creek
Map # STR-7
Dungeness
Map # STR-8
Discovery
Bay
Map STR-9
Port Ebey
Map STR-10
112
101

4.2.2 BOOMING STRATEGY PRIORITY TABLES

Table 4-1

Potential Spill Origin: STR-A - West of Neah Bay			
BOOMING PRIORITY	STRATEGY NUMBER	MAP PAGE NUMBER	COMMENTS
1	STR-1	4-8	
2	STR-2	4-8	
3	OC-3	4-3	Refer to the Outer Coast GRP for the remaining strategies
4	OC-4a	4-3	
5	OC-4b	4-3	
6	OC-5a	4-3	
7	OC-5b	4-3	
8	OC-5c	4-3	

Table 4-2

Potential Spill Origin: STR-B - Off Shipwreck Point			
BOOMING PRIORITY	STRATEGY NUMBER	MAP PAGE NUMBER	COMMENTS
1	STR-2	4-8	
2	STR-3	4-8	
3	STR-4	4-8	
4	STR-5	4-8	
5	STR-6	4-9	
6	STR-1	4-8	
7	STR-9	4-9	
8	STR-8	4-9	
9	STR-7	4-9	

Table 4-3

Potential Spill Origin: STR-C - Off Clallum Bay			
BOOMING PRIORITY	STRATEGY NUMBER	MAP PAGE NUMBER	COMMENTS
1	STR-9	4-9	
2	STR-8	4-9	
3	STR-7	4-9	
4	STR-6	4-9	
5	STR-11	4-10	
6	STR-10	4-10	

Table 4-4

Potential Spill Origin: STR-D - Off Pillar Point			
BOOMING PRIORITY	STRATEGY NUMBER	MAP PAGE NUMBER	COMMENTS
1	STR-12	4-10	
2	STR-13	4-10	
3	STR-14	4-10	
4	STR-15	4-10	
5	STR-9	4-9	
6	STR-8	4-9	
7	STR-11	4-10	
8	STR-10	4-10	

Table 4-5

Potential Spill Origin: STR-E - Off Twin Rivers			
BOOMING PRIORITY	STRATEGY NUMBER	MAP PAGE NUMBER	COMMENTS
1	STR-12	4-10	
2	STR-13	4-10	
3	STR-14	4-10	
4	STR-18	4-11	
5	STR-17	4-11	
6	STR-16	4-11	
7	STR-15	4-10	
8	STR-19	4-11	
9	STR-20	4-11	
10	STR-21	4-12	

Table 4-6

Potential Spill Origin: STR-F - Off the Elwha River			
BOOMING PRIORITY	STRATEGY NUMBER	MAP PAGE NUMBER	COMMENTS
1	STR-21	4-12	
2	STR-22	4-12	
3	STR-12	4-10	
4	STR-13	4-10	
5	STR-14	4-10	

Table 4-7

Potential Spill Origin: STR-G - Port Angeles Harbor, TESORO Facility			
BOOMING PRIORITY	STRATEGY NUMBER	MAP PAGE NUMBER	COMMENTS
1	STR-25a	4-13	
2	STR-25b	4-13	
3	STR-24	4-13	
4	STR-27	4-13	
5	STR-29	4-14	
6	STR-30	4-14	
7	STR-26	4-13	
8	STR-28	4-13	
9	STR-31	4-14	
10	STR-32	4-15	

Table 4-8

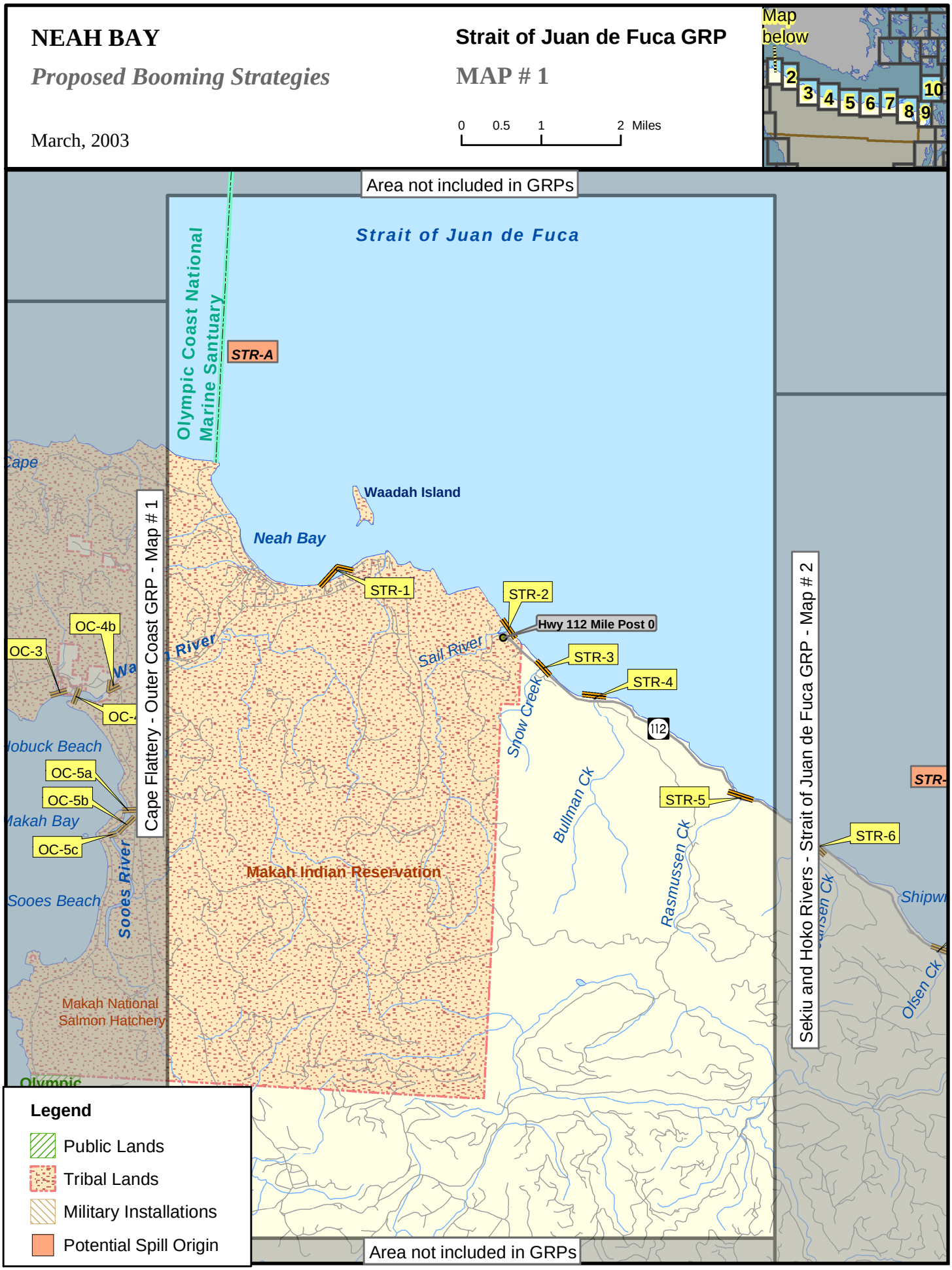
Potential Spill Origin: STR-H - Northeast of Port Angeles			
BOOMING PRIORITY	STRATEGY NUMBER	MAP PAGE NUMBER	COMMENTS
1	STR-24	4-13	
2	STR-29	4-14	
3	STR-30	4-14	
4	STR-31	4-14	
5	STR-25a	4-13	
6	STR-25b	4-13	
7	STR-27	4-13	
8	STR-26	4-13	
9	STR-28	4-13	

Table 4-9

Potential Spill Origin: STR-I - East of Dungeness			
BOOMING PRIORITY	STRATEGY NUMBER	MAP PAGE NUMBER	COMMENTS
1	STR-33	4-15	
2	STR-34	4-15	
3	STR-32	4-15	
4	STR-35	4-15	

Table 4-10

Potential Spill Origin: STR-J - Entrance to Admiralty Inlet			
BOOMING PRIORITY	STRATEGY NUMBER	MAP PAGE NUMBER	COMMENTS
1		4-17	Any spill in this area does not affect shoreline in 12 hours. Concentrate recovery efforts on on-water recovery and consider In-situ Burning and Dispersants.


NEAH BAY
Proposed Booming Strategies
March, 2003
Strait of Juan de Fuca GRP
MAP # 1
0 0.5 1 2 Miles
Map below
2 3 4 5 6 7 8 9 10
Area not included in GRPs
Strait of Juan de Fuca
Olympic Coast National Marine Santuary
STR-A
Waadah Island
Neah Bay
STR-1
STR-2
Hwy 112 Mile Post 0
STR-3
STR-4
112
Sail River
Snow Creek
Bullman Ck
Rasmussen Ck
STR-5
STR-6
Cape Flattery - Outer Coast GRP - Map # 1
Sekiu and Hoko Rivers - Strait of Juan de Fuca GRP - Map # 2
OC-3
OC-4b
OC-5a
OC-5b
OC-5c
Sooes River
Sooes Beach
Makah Bay
Makah Indian Reservation
Makah National Salmon Hatchery
Olsen Ck
Area not included in GRPs
Legend
Public Lands
Tribal Lands
Military Installations
Potential Spill Origin

SEKIU AND HOKO RIVERS

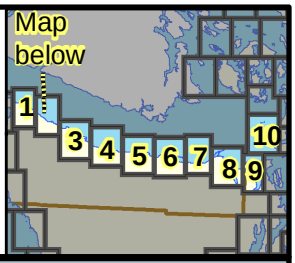
Proposed Booming Strategies

March, 2003

Strait of Juan de Fuca GRP

MAP # 2

0 0.5 1 2 Miles



Area not included in GRPs

Strait of Juan de Fuca

st 0

STR-4

112

STR-B

STR-5

STR-6

Rasmussen Ck

Neah Bay - Strait of Juan de Fuca GRP - Map # 1

Jansen Ck

Shipwreck Point

STR-7

Olsen Ck

112

STR-8

STR-9

Kydaka Point

Sekiu River

Hwy 112 Mile Post 10

STR-C

Hoko River

Falls Ck

Sekiu

llam Bay

STR-10

ST

Clallam Bay/Pysht River - Strait of Juan de Fuca GRP - Map # 3

Legend

- Public Lands
- Tribal Lands
- Military Installations
- Potential Spill Origin

Area not included in GRPs

CLALLAM BAY/PYSHT RIVER

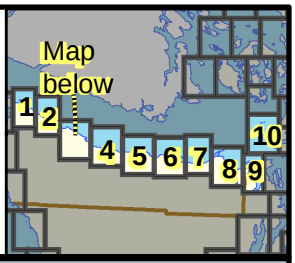
Proposed Booming Strategies

March, 2003

Strait of Juan de Fuca GRP

MAP # 3

0 0.5 1 2 Miles



Area not included in GRPs

Sekiu and Hoko Rivers - Strait of Juan de Fuca GRP - Map # 2

Strait of Juan de Fuca

STR-C

STR-D

Sekiu

Clallam Bay

STR-10

STR-11

Clallam River

Hwy112 Mile Post 20

STR-13

STR-12

STR-14

STR-15

Pillar Point

Pillar Point County Park

Pysht River

Butler Ck

Hwy112 Mile Post 30

STR-

Jim Creek

112

112

113

Twin Rivers - Strait of Juan de Fuca GRP - Map # 4

Legend

- Public Lands
- Tribal Lands
- Military Installations
- Potential Spill Origin

Area not included in GRPs

TWIN RIVERS

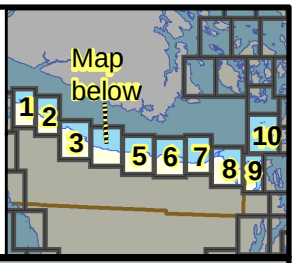
Proposed Booming Strategies

March, 2003

Strait of Juan de Fuca GRP

MAP # 4

0 0.5 1 2 Miles



Area not included in GRPs

Strait of Juan de Fuca

Clallam Bay/Pysht River - Strait of Juan de Fuca GRP - Map # 3

Salt Creek - Strait of Juan de Fuca GRP - Map # 5

STR-D

STR-E

STR-16

STR-17

STR-18

STR-19

STR-20

Jim Creek Recreational Area

Jim Creek

Joe Creek

Deep Creek

West Twin River

East Twin River

Hwy112 Mile Post 40

112

Legend

- Public Lands
- Tribal Lands
- Military Installations
- Potential Spill Origin

Area not included in GRPs

SALT CREEK

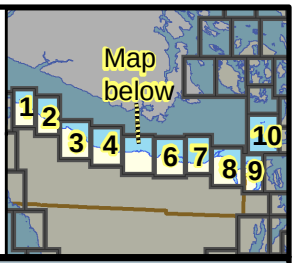
Proposed Booming Strategies

March, 2003

Strait of Juan de Fuca GRP

MAP # 5

0 0.5 1 2 Miles



Area not included in GRPs

Strait of Juan de Fuca

Twin Rivers - Strait of Juan de Fuca GRP - Map # 4

Port Angeles - Strait of Juan de Fuca GRP - Map # 6

STR-21

STR-22

Crescent Bay

Salt Creek Recreation Area

Salt Creek

Lyre River Campground

Lyre River

Hwy 112 Mile Post 50

Freshwater Bay Boat Launch Ramp

112

101

Legend

- Public Lands
- Tribal Lands
- Military Installations
- Potential Spill Origin

Area not included in GRPs

PORT ANGELES

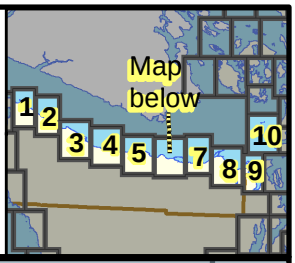
Proposed Booming Strategies

March, 2003

Strait of Juan de Fuca GRP

MAP # 6

0 0.5 1 2 Miles



Area not included in GRPs

Strait of Juan de Fuca

Ferry Route

STR-F

Salt Creek - Strait of Juan de Fuca GRP - Map # 5

Morse Creek - Strait of Juan de Fuca GRP - Map # 7

STR-23

Freshwater Bay

Lower Elwha Klallam Indian Reservation

Elwha River

STR-24

Port Angeles Coast Guard Air Station Heliport

Ediz Hook

STR-25a

STR-G

Daishowa Lagoon

STR-25b

STR-26

Port Angeles Harbor

STR-27

STR-28

112

Clallam County Airport

City of Port Angeles

Hwy 112 Mile Post 60

101

Tumwater Creek

Valley Creek

Peabody Creek

Legend

- Public Lands
- Tribal Lands
- Military Installations
- Potential Spill Origin

Area not included in GRPs

MORSE CREEK

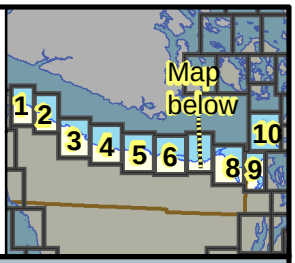
Proposed Booming Strategies

March, 2003

Strait of Juan de Fuca GRP

MAP # 7

0 0.5 1 2 Miles



Area not included in GRPs

Strait of Juan de Fuca

STR-H

Port Angeles - Strait of Juan de Fuca GRP - Map # 6

Dungeness - Strait of Juan de Fuca GRP - Map # 8

Heliport

Dungeness Wildlife

STR-29

STR-30

STR-31

Morse Creek

Siebert Creek

McDonald Creek

101

Legend

- Public Lands
- Tribal Lands
- Military Installations
- Potential Spill Origin

Area not included in GRPs

DUNGENESS

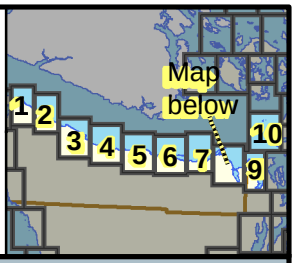
Proposed Booming Strategies

March, 2003

Strait of Juan de Fuca GRP

MAP # 8

0 0.5 1 2 Miles



Area not included in GRPs

Strait of Juan de Fuca

STR-32

Dungeness Spit

Dungeness National Wildlife Refuge

Dungeness Bay

STR-I

STR-33

STR-34

STR-36b

Dungeness

Old Town

STR-35

STR-36d

STR-36a

STR-36c

Dungeness Recreation Area

Meadowbrook Ck

Dungeness River

Morse Creek - Strait of Juan de Fuca GRP - Map # 7

Discovery Bay - Strait of Juan de Fuca GRP - Map # 9

STR-37

Gibson Spit

Travis Spit

City of Sequim

Bell Creek

101

STR-38

STR-39

The Middle Ground

STR-40

Pitship Point

Sequim Bay

Sequim Bay State Park

Legend

- Public Lands
- Tribal Lands
- Military Installations
- Potential Spill Origin

Area not included in GRPs

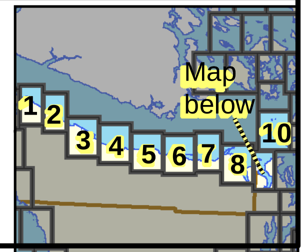
DISCOVERY BAY

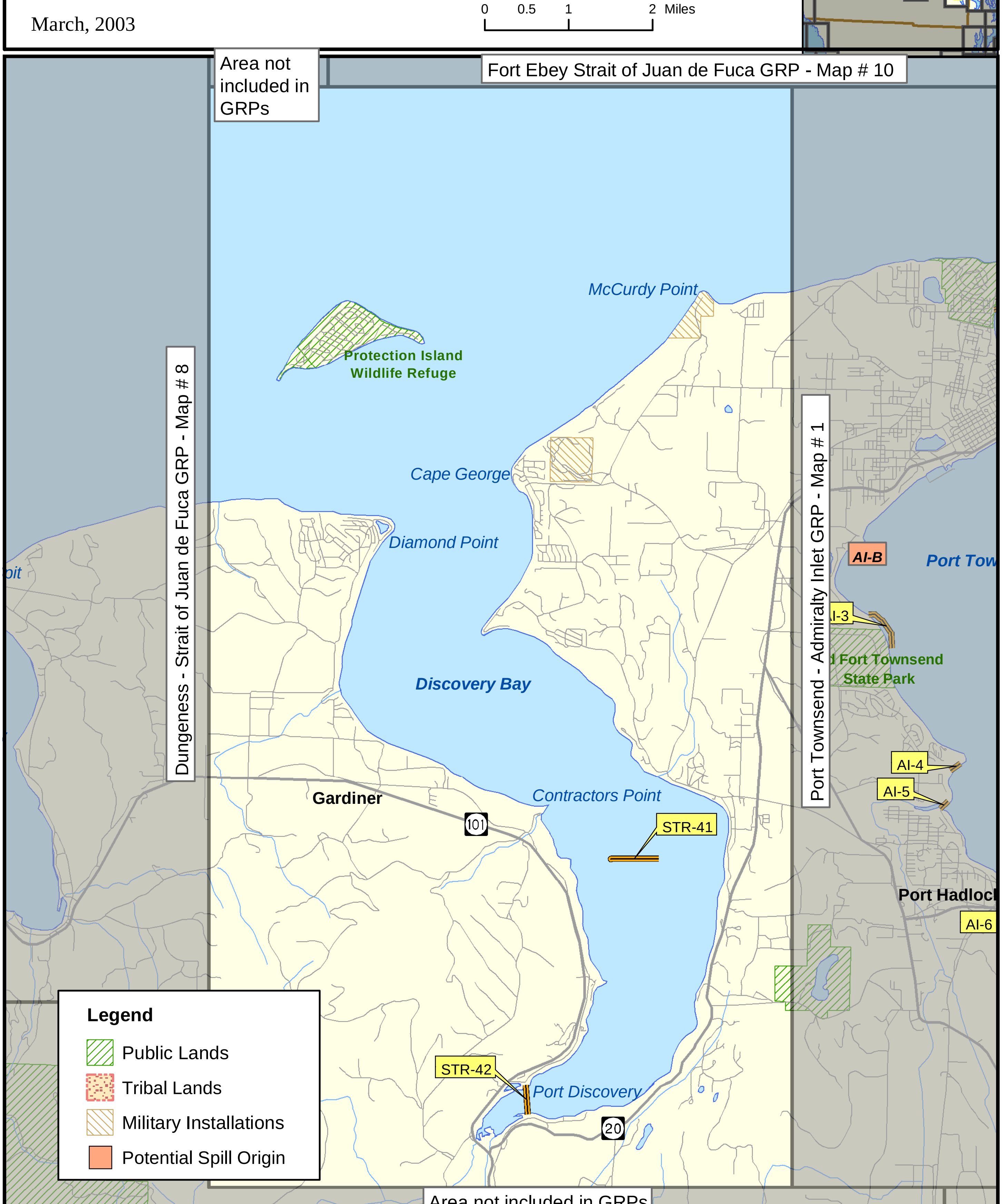
Proposed Booming Strategies

March, 2003

Strait of Juan de Fuca GRP

MAP # 9





FORT EBEY

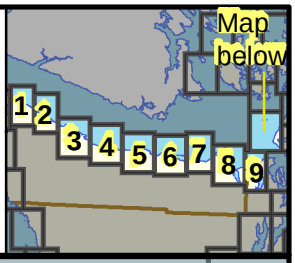
Proposed Booming Strategies

March, 2003

Strait of Juan de Fuca GRP

MAP # 10

0 0.5 1 2 Miles



South Lopez Island -San Juan Islands GRP - Map # 6

Deception Pass - North Central Puget Sound - Map # 1

Area not included in GRPs

Minor Island

Smith Island

Whidbey Island

Partridge, Point

Fort Ebey State Park

Penn Cove

20

STR-J

Oak Harbor - North Central Puget Sound GRP - Map # 3

Legend

- Public Lands
- Tribal Lands
- Military Installations
- Potential Spill Origin

Discovery Bay - Strait of Juan de Fuca GRP - Map # 9

Port Townsend - Admiralty Inlet GRP - Map # 1

4.3.2 Proposed Booming and Collection Strategies: Matrices

Strategy	Status	Location	Response Strategy	Length of Boom	Strategy Implementation	Staging Area	Site Access	Resources Protected
STR-1	Field visit 6/00	Neah Bay CLA0439	Exclusion / Collection - Keep oil off the beach.	2000'	Deploy boom from the end of the breakwater on the east side of the marina (48º-22.093'N 124º-36.405'W) to the shoreside end of the USCG pier (48º-22.195'N 124º-35.910'W). Additional boom can be deployed from the end of the breakwater to enhance collection.	Stage from the Neah Bay Marina.	By boat from the ramp in Neah Bay. Vehicle access from Highway 112 to Neah Bay.	Steller's sea lions, shellfish, archaeological sites.
STR-2	Field visit 6/00	Sail River CLA0430 48º-21.620'N 124º-33.320'W	Exclusion - Keep oil out of the river mouth.	400'	Deploy boom across the entrance to the small inlet at the mouth of the river. A small workboat or skiff will be required. Move the boom further into the inlet if heavy seas prevent deployment at the entrance.	Stage at the old campground on the south side of the inlet, or from Neah Bay.	By boat from the ramp in Neah Bay, or launch a skiff at the site. Vehicle access from Highway 112, about 2 miles southeast of Neah Bay.	Salmon.
STR-3	Field visit 6/00	Snow Creek CLA0428 48º-21.220'N 124º-32.730'W	Exclusion - Keep oil out of the creek mouth.	100'	Deploy boom from land across the mouth of the creek.	Stage in the parking lot for the store and boat ramp at the creek mouth.	Vehicle access from Highway 112, Mile Post 0.7.	Coho salmon - Feb./June out-migration.
STR-4	Field visit 6/00	Bullman Creek CLA0425 48º-20.935'N 124º-31.845'W	Exclusion - Keep oil out of the creek mouth.	100'	Deploy boom from land across the mouth of the creek.	Stage along Highway 112 at the creek mouth.	Vehicle access from Highway 112, Mile Post 1.5.	Coho salmon - Feb./June out-migration. Water collection point for local residents.
STR-5	Field visit 6/00	Rasmussen Creek CLA0417 48º-19.925'N 124º-29.365'W	Exclusion - Keep oil out of the creek mouth.	100'	Deploy boom from land across the mouth of the creek.	Stage along Highway 112 at the creek mouth.	Vehicle access from Highway 112, Mile Post 3.9.	Coho salmon - Feb./June out-migration.

4.3.2 Proposed Booming and Collection Strategies: Matrices

Strategy	Status	Location	Response Strategy	Length of Boom	Strategy Implementation	Staging Area	Site Access	Resources Protected
STR-6	Field visit 6/00	Jansen Creek CLA0414 48º-19.430'N 124º-28.115'W	Exclusion - Keep oil out of the creek mouth.	100'	The creek discharges through two culverts, and the stream flow will prevent oil from entering the culverts most of the year. If the stream flow is low, block the culverts to prevent oil from entering the culverts at high tide.	Stage along Highway 112 at the creek mouth.	Vehicle access from Highway 112, Mile Post 5.1.	Coho salmon - Feb./June out-migration.
STR-7	Field visit 6/00	Olsen Creek CLA0408 48º-18.355'N 124º-26.030'W	Exclusion - Keep oil out of the creek mouth.	100'	Deploy boom from land across the mouth of the creek.	Stage along Highway 112 at the creek mouth.	Vehicle access from Highway 112, Mile Post 7.2.	Coho salmon - Feb./June out-migration.
STR-8	Field visit 6/00	Sekiu River CLA0401 48º-17.280'N 124º-23.685'W	Exclusion - Keep oil out of the river mouth.	500'	Deploy boom from land across the mouth of the river.	Stage along Highway 112 from a side road east of the bridge.	Vehicle access from Highway 112, Mile Post 9.5.	Coho salmon - Feb./June out-migration. Harbor seal haul-outs.
STR-9	Field visit 6/00	Hoko River CLA0396 48º-17.255'N 124º-21.665'W	Exclusion - Keep oil out of the river mouth and estuary.	500'	Deploy boom across the mouth of the river. A skiff will be required.	Stage along Highway 112 or in the residential development on the west side of the river.	Access by boat from Sekiu. Vehicle access from Highway 112, Mile Post 10.5. Access to the river mouth by land is through private property (obtain permission) on the west side of the river.	Coho salmon - Feb./June out-migration, harbor seal haul-outs, shellfish, and archeological sites.

4.3.2 Proposed Booming and Collection Strategies: Matrices

Strategy	Status	Location	Response Strategy	Length of Boom	Strategy Implementation	Staging Area	Site Access	Resources Protected
STR-10	Field visit 6/00	Falls Creek CLA0380 48º-15.525'N 124º-17.710'W	Exclusion - Keep oil out of the creek mouth.	100'	Deploy boom from land across the mouth of the creek.	Stage from the parking lot on the west side of the creek.	Vehicle access from Highway 112, Mile Post 14.8. Take the Sekiu exit and drive back to the creek through the treatment plant lot.	Chum salmon - Feb./June out-migration.
STR-11	Field visit 6/00	Clallam River CLA0374	Exclusion - Keep oil out of the river.	500'	Deploy boom as necessary to keep oil out of the river mouth and the channel behind the sand spit. The position of the river mouth is variable and can be anywhere along the sand spit.	Stage from the parking lot in the Clallam Bay County Park (closes at sunset), or from Sekiu.	Boat access from Sekiu. Vehicle access from Highway 112, Mile Post 16.7.	Salmon.
STR-12	Field visit 6/00	Pysht River CLA0342 48º-12.420'N 124º-6.410'W	Exclusion - Keep oil out of the river and Indian Creek estuary.	500'	Deploy boom across the river at the mouth to prevent oil from being pushed into the river mouth and creek estuary at high tide. Angle the boom to direct oil to the east side of the river for possible collection.	Stage from the private road on the northeast side of the river (Pillar Point), from the Pillar Point County Park (CLA0338), or from the Jim Creek Receation Area (CLA0332).	Boat access from the Pillar Point County Park ramp (high tide only), or from the ramp at the Jim Creek Receation Area. Vehicle access from Highway 112 to the road to the river mouth at Mile Post 28.6 (for access, call Merrill & Ring at 1-800-998-2382), to the county park at Mile Post 29.8, and to the Jim Creek Rec. Area at Mile Post 31.5 (also owned by Merrill & Ring).	Shellfish, salmon, salmonid rearing habitat, and waterfowl concentrations.

4.3.2 Proposed Booming and Collection Strategies: Matrices

Strategy	Status	Location	Response Strategy	Length of Boom	Strategy Implementation	Staging Area	Site Access	Resources Protected
STR-13	Field visit 6/00	Pysht River CLA0342 48º-12.645'N 124º-6.480'W	Exclusion - Keep oil out of the river.	500'	Deploy boom across the river to back-up STR-12. Angle the boom to direct oil to the east side of the river for possible collection.	Same as for STR-12.	Same as for STR-12.	Salmon, salmonid rearing habitat, and waterfowl concentrations.
STR-14	New strategy 1/02	Indian Creek Estuary CLA0340 48º-12.265'N 124º-6.520'W	Exclusion - Keep oil out of the creek estuary.	200'	Deploy boom across the entrance to the creek estuary. Site is dry at low tide. Use a skiff or small work boat to pull the boom across the river.	Same as for STR-12.	Same as for STR-12.	Salmon, salmonid rearing habitat, and waterfowl concentrations.
STR-15	New strategy 1/02	Butler Creek CLA0338 48º-11.955'N 124º-5.920'W	Exclusion - Keep oil out of the creek mouth.	100'	The creek discharges through a culvert, and the stream flow will prevent oil from entering the culvert most of the year. If the stream flow is low, block the culvert to prevent oil from entering the culvert at high tide.	Stage from the Pillar Point County Park.	The creek mouth is at the east end of the lower parking lot in the Pillar Point County Park. Vehicle access from Highway 112 at Mile Post 29.8.	Salmon.
STR-16	Field visit 6/00	Jim Creek CLA0332 48º-11.190'N 124º-3.760'W	Exclusion - Keep oil out of the creek mouth.	100'	The creek discharges through a culvert, and the stream flow will prevent oil from entering the culvert most of the year. If the stream flow is low, block the culvert to prevent oil from entering the culvert at high tide.	Stage from the Jim Creek Recreation Area.	The creek mouth is on the west side of the breakwater for the boat basin/ramp in the Jim Creek Recreation Area (owned by Merrill & Ring 1-800-998-2382). Vehicle access from Highway 112 at Mile Post 31.5.	Coho salmon.

4.3.2 Proposed Booming and Collection Strategies: Matrices

Strategy	Status	Location	Response Strategy	Length of Boom	Strategy Implementation	Staging Area	Site Access	Resources Protected
STR-17	Field visit 6/00	Joe Creek CLA0330 48º-10.785'N 124º-3.120'W	Exclusion - Keep oil out of the creek mouth.	100'	Deploy boom from land across the mouth of the creek.	Stage from the Jim Creek Recreation Area.	The creek mouth is 1/2 mile east of the Jim Creek Recreation Area (owned by Merrill & Ring 1-800-998-2382). Access the site on the beach from Jim Creek.	Coho salmon.
STR-18	Field visit 3/99	Mouth of Deep Creek CLA0326 48º-10.485'N 124º-1.490'W	Exclusion - Keep oil out of the creek mouth.	200'	Deploy boom from land across the mouth of the creek.	Stage from a small dirt road off Highway 112 on the east side of the creek.	Vehicle access off Highway 112 at Mile Post 34.7, turn north off the highway onto a dirt road on the east side of the creek.	Shellfish, salmon, and smelt spawning.
STR-19	Field visit 6/00	West Twin River CLA0315 48º-9.940'N 123º-57.080'W	Exclusion - Keep oil out of the river mouth.	200'	Deploy boom from land across the mouth of the river.	Stage from a dirt road and parking area off Highway 112 on the east side of the West Twin River.	Vehicle access off Highway 112 at Mile Post 38.6, turn north off the highway onto a dirt road on the east side of the West Twin River.	Shellfish, salmon, and smelt spawning.
STR-20	Field visit 6/00	East Twin River CLA0314 48º-9.970'N 123º-56.755'W	Exclusion - Keep oil out of the river mouth.	100'	Deploy boom from land across the mouth of the river. Access to the river mouth is through private property.	Stage from a dirt road and parking area off Highway 112 on the west side of the East Twin River.	Vehicle access off Highway 112 at Mile Post 38.6, turn north off the highway onto a dirt road on the west side of the East Twin River.	Shellfish, salmon, and smelt spawning.

4.3.2 Proposed Booming and Collection Strategies: Matrices

Strategy	Status	Location	Response Strategy	Length of Boom	Strategy Implementation	Staging Area	Site Access	Resources Protected
STR-21	Field visit 6/00	Lyre River CLA0295 48º-9.580'N 123º-49.645'W	Exclusion - Keep oil out of the river mouth.	300'	Deploy boom from land across the mouth of the river. Access to the river mouth is from the campground on the west side of the river. Seasonal strategy, high river flow will keep oil out of the mouth.	Stage from the Lyre River Campground; privately owned (360-928-3436).	Vehicle access off Highway 112 at Mile Post 45.6, turn north off the highway to the Lyre River Campground and check in with the owner.	Gull congregation area for freshwater drinking and bathing, salmon, marine mammals, trout, and perch.
STR-22	Field visit 6/00	Salt Creek CLA0270 48º-9.765'N 123º-42.185'W	Exclusion - Keep oil out of the creek.	200'	Deploy boom from land across the mouth of the creek. In rough weather, deploy the boom further up the creek if necessary.	Stage from the Salt Creek County Park on the east side of the creek.	Vehicle access from Highway 112 at Mile Post 53.9 on Camp Hayden Road, or at Mile Post 51.0 on Crescent Beach Road. Both roads will lead to Salt Creek, on the east end of Crescent Bay.	Wetlands, and public recreation area.
STR-23	Field visit 3/99	Elwha River CLA0241 48º-8.715'N 123º-33.965'W	Exclusion - Keep oil out of the river mouth.	1000'	Deploy boom across the mouth of the river. Necessary only with low river flow and high tide. The position of the river mouth is variable due to shifting delta sediments, and the amount of boom required will also be variable. Verify the position and size of the opening by helicopter prior to deployment if possible. A chevron is likely to be the most effective boom configuration.	Stage from the boat ramp on the west side of Freshwater Bay, from Port Angeles, or on the Lower Elwha Tribe Reservation.	Boat access from the ramp in Freshwater Bay or Port Angeles. Possible vehicle access through tribal land, Lower Elwha Tribe contact 360-452-8471.	Gull congregation area for freshwater drinking and bathing, salmon, marine mammals, harlequin ducks, and urchin concentrations..

4.3.2 Proposed Booming and Collection Strategies: Matrices

Strategy	Status	Location	Response Strategy	Length of Boom	Strategy Implementation	Staging Area	Site Access	Resources Protected
STR-24	New strategy 1/02	Ediz Hook Beach - Port Angeles Harbor CLA0207	Exclusion - Keep oil off the sand lance spawning beach.	2500'	Deploy boom from the old boat ramp on the inside beach of Ediz Hook at 48º-8.500'N 123º-25.642'W to protect as much beach as possible to the west of the boat ramp.	Stage from the parking area at the old boat ramp, or from Port Angeles.	Boat access from Port Angeles. Vehicle access from Highway 101 to Marine Drive in Port Angeles to Ediz Hook Road.	Sand lance spawning.
STR-25a	Field test 5/00	Daishowa Lagoon - Outer Strategy CLA0200 48º-8.085'N 123º-27.725'W	Exclusion - Keep oil out of the lagoon.	1000'	Deploy boom from the seawall southwest of the lagoon entrance to the shoreline to the north.	Stage from the parking area near the lagoon entrance.	Boat access from Port Angeles. Vehicle access from Highway 101 to Marine Drive in Port Angeles to Daishowa.	Lagoon, waterfowl concentrations.
STR-25b	Field test 5/00	Daishowa Lagoon - Inner Strategy CLA0197 48º-8.075'N 123º-27.780'W	Exclusion - Keep oil out of the lagoon.	200'	Deploy boom in a chevron configuration across the lagoon entrance as a back up for STR-25a.	Stage from the parking area near the lagoon entrance.	Boat access from Port Angeles. Vehicle access from Highway 101 to Marine Drive in Port Angeles to Daishowa.	Lagoon, waterfowl concentrations.
STR-26	New strategy 1/02	Tumwater Creek CLA0194 48º-7.460'N 123º-26.675'W	Exclusion - Keep oil out of the creek mouth.	200'	Deploy boom across the creek mouth.	Stage from Tumwater Street at the creek mouth.	Boat access from Port Angeles. Vehicle access from Highway 101 to Front Street to Tumwater Street.	Salmonids.
STR-27	New strategy 1/02	Valley Creek - City Park CLA0193 48º-7.390'N 123º-26.260'W	Exclusion - Keep oil out of the creek mouth and public beach area at the mouth.	600'	Deploy boom across the entrance to the small inlet at the city park and beach at the creek mouth.	Stage from the city park.	Boat access from Port Angeles. Vehicle access from Highway 101 to Front Street.	Salmon, public park.

4.3.2 Proposed Booming and Collection Strategies: Matrices

Strategy	Status	Location	Response Strategy	Length of Boom	Strategy Implementation	Staging Area	Site Access	Resources Protected
STR-28	New strategy 1/02	Peabody Creek CLA0191 48º-7.230'N 123º-25.700'W	Exclusion - Keep oil out of the creek mouth.	300'	Deploy boom across the entrance to the creek mouth, from the northern end of the riprap on the west side to the base of the pier on the east side. The boom can be deployed from land without a boat.	Stage from the parking area on the east side of the creek.	Boat access from Port Angeles. Vehicle access from Highway 101 to North Laurel Street.	Salmonids.
STR-29	Field test 8/96	Morse Creek CLA0178 48º-7.090'N 123º-21.080'W	Exclusion - Keep oil out of the creek mouth.	400'	Deploy boom across the entrance to the creek mouth in a chevron configuration. If heavy seas prevent deployment as described, back up into the creek mouth as necessary. The back up strategy can be deployed from land without a boat.	Stage from Port Angeles, or the road on the east side of the creek.	Boat access from Port Angeles. Vehicle access from Highway 101 at Mile Post 251.7 to Strait View Drive.	Salmonids.
STR-30		Siebert Creek CLA0166 48º-7.245'N 123º-17.305'W	Exclusion - Keep oil out of the creek mouth.	200'	Deploy boom across the entrance to the creek mouth.	Stage from Port Angeles.	Boat access from Port Angeles.	Coho salmon.
STR-31		McDonald Creek CLA0152 48º-7.540'N 123º-13.175'W	Exclusion - Keep oil out of the creek mouth.	200'	Deploy boom across the entrance to the creek mouth.	Stage from Port Angeles.	Boat access from Port Angeles.	Coho, pink, and chum salmon.
STR-32	Field test 8/96	Dungeness Spit CLA0131 48º-10.560'N 123º-7.680'W	Exclusion - Keep oil out of the small cove.	1000'	Deploy boom across the entrance to the small cove midway down the east side of Dungeness Spit.	Stage from the Oyster House boat ramp (CLA0113), the John Wayne Marina in Sequim Bay, or from Port Angeles.	Boat access from the Oyster House ramp, the John Wayne Marina, or Port Angeles. No vehicle access.	Shorebird and waterfowl concentrations.

4.3.2 Proposed Booming and Collection Strategies: Matrices

Strategy	Status	Location	Response Strategy	Length of Boom	Strategy Implementation	Staging Area	Site Access	Resources Protected
STR-33	Field visit 8/96	Outer Graveyard Spit CLA0125 48º-9.290'N 123º-8.540'W	Exclusion/ Deflection/ Collection - Keep oil out of Dungeness Bay.	2200'	Deploy boom from the southeast end of Graveyard Spit across the entrance of the bay to the Oyster House boat ramp. Collect oil at the boat ramp.	Stage from the Oyster House boat ramp (CLA0113).	Boat access from the Oyster House ramp, the John Wayne Marina, or Port Angeles. Vehicle access to the Oyster House boat ramp from Highway 101 in Sequim to Sequim-Dungeness Way to Marine Drive.	Shorebird and waterfowl concentrations, seabirds, marine mammals, and raptors. Extensive eel grass beds and associated fauna.
STR-34	Field visit 8/96	Inner Graveyard Spit CLA0115 48º-9.410'N 123º-8.830'W	Exclusion - Keep oil out of Dungeness Bay.	2500'	Back up strategy for STR-33. Deploy boom from the southwest end of Graveyard Spit across the entrance of the bay to the tip of the spit on the opposite shore.	Stage from the Oyster House boat ramp (CLA0113).	Boat access from the Oyster House ramp, the John Wayne Marina, or Port Angeles. Vehicle access to the Oyster House boat ramp from Highway 101 in Sequim to Sequim-Dungeness Way to Marine Drive.	Shorebird and waterfowl concentrations, seabirds, marine mammals, and raptors. Extensive eel grass beds and associated fauna.
STR-35	New strategy 1/02	Old Town Slough CLA0112 48º-9.060'N 123º-8.220'W	Exclusion - Keep oil out of the slough.	300'	Deploy boom from across the entrance to the slough. Boom can be deployed from land from the Oyster House boat ramp parking area (the slough is a short distance to the east of the lot).	Stage from the Oyster House boat ramp (CLA0113).	Boat access from the Oyster House ramp. Vehicle access to the Oyster House boat ramp from Highway 101 in Sequim to Sequim-Dungeness Way to Marine Drive.	Shorebird and waterfowl concentrations, marsh habitat.

4.3.2 Proposed Booming and Collection Strategies: Matrices

Strategy	Status	Location	Response Strategy	Length of Boom	Strategy Implementation	Staging Area	Site Access	Resources Protected
STR-36a	Field visit 8/96	West Channel of the Dungeness River Mouth CLA0111 48º-9.030'N 123º-7.925'W	Exclusion - Keep oil out of the Dungeness River.	200'	Deploy boom across the west channel of the Dungeness River as near to the mouth as possible. The position of the mouth is variable due to shifting delta sediments.	Stage from the Oyster House boat ramp (CLA0113).	Boat access from the Oyster House ramp, the John Wayne Marina, or Port Angeles. Vehicle access to the Oyster House boat ramp from Highway 101 in Sequim to Sequim-Dungeness Way to Marine Drive. Potential access to the site from Marine Drive to Rivers End Road.	Salmon.
STR-36b	Field visit 8/96	East Channel of the Dungeness River Mouth CLA0110 48º-9.100'N 123º-7.360'W	Exclusion - Keep oil out of the Dungeness River.	200'	Deploy boom across the east channel of the Dungeness River as near to the mouth as possible. The position of the mouth is variable due to shifting delta sediments. Ensure that the boom also protects the mouth of Meadowbrook Creek that discharges under Sequim-Dungeness Way.	Stage from the Oyster House boat ramp (CLA0113).	Boat access from the Oyster House ramp, the John Wayne Marina, or Port Angeles. Vehicle access to the Oyster House boat ramp from Highway 101 in Sequim to Sequim-Dungeness Way to Marine Drive. Access to the site along the beach from the end of Sequim-Dungeness Way.	Salmon.

4.3.2 Proposed Booming and Collection Strategies: Matrices

Strategy	Status	Location	Response Strategy	Length of Boom	Strategy Implementation	Staging Area	Site Access	Resources Protected
STR-36c		Dungeness River at Marine Drive CLA0109 48º-8.625'N 123º-7.660'W	Exclusion - Keep oil out of the Dungeness River.	200'	Back up strategy if STR-36a&b cannot be deployed. Deploy boom across the river at the bridge on Marine Drive.	Stage from the Oyster House boat ramp (CLA0113).	Boat access from the Oyster House ramp, the John Wayne Marina, or Port Angeles. Vehicle access to the Oyster House boat ramp from Highway 101 in Sequim to Sequim-Dungeness Way to Marine Drive. Access to the site along the beach from the end of Sequim-Dungeness Way.	Salmon.
STR-36d		Meadowbrook Creek CLA0109 48º-9.075'N 123º-7.265'W	Exclusion - Keep oil out of the creek.	100'	Back up strategy if STR-36a&b cannot be deployed. Deploy boom across the mouth of Meadowbrook Creek at the bridge on Sequim-Dungeness Way.	Stage along Sequim-Dungeness Way at the site.	Vehicle access from Highway 101 in Sequim to Sequim-Dungeness Way.	Salmon.
STR-37		Bell Creek Lagoon CLA0084 48º-4.960'N 123º-2.610'W	Exclusion - Keep oil out of the lagoon behind Gibson Spit.	1000'	Deploy boom across the entrance to the lagoon.	Stage from the John Wayne Marina in Sequim Bay, or the Oyster House boat ramp.	Vehicle access from Highway 101 to the Old Olympic Highway to Washington Harbor Road.	Waterfowl, salmon.

4.3.2 Proposed Booming and Collection Strategies: Matrices

Strategy	Status	Location	Response Strategy	Length of Boom	Strategy Implementation	Staging Area	Site Access	Resources Protected
STR-38		Travis Spit CLA0034 48º-4.800'N 123º-2.435'W	Diversion - Divert oil entering bay to the west channel for collection at Pitship Point.	1500'	Deploy boom from the southwestern tip of Travis Spit to the Middle Ground to direct the oil to the west and south for collection at Pitship Point. The Middle Ground is often covered at high tide.	Stage from the John Wayne Marina in Sequim Bay.	Vehicle access to the marina from Highway 101 to the Old Olympic Highway.	Waterfowl, seabirds, harbor seals, baitfish spawning beaches, shellfish, and Sequim Bay State Park.
STR-39		Middle Ground CLA0079 48º-4.500'N 123º-2.500'W	Diversion - Divert oil entering bay to the west channel for collection at Pitship Point.	1500'	Deploy boom directly south from the Middle Ground to direct the oil to the west and south for collection at Pitship Point. The Middle Ground is often covered at high tide.	Stage from the John Wayne Marina in Sequim Bay.	Vehicle access to the marina from Highway 101 to the Old Olympic Highway.	Waterfowl, seabirds, harbor seals, baitfish spawning beaches, shellfish, and Sequim Bay State Park.
STR-40		Pitship Point (John Wayne Marina) CLA0076 48º-3.850'N 123º-2.340'W	Collection - Collect oil entering the bay as it is diverted by STR-37 and 38.	1300'	Deploy boom from the northeast corner of Pitship Point at a northeasterly direction to collect oil diverted by STR-38 and 39.	Stage from the John Wayne Marina in Sequim Bay.	Vehicle access to the marina from Highway 101 to the Old Olympic Highway.	Waterfowl, seabirds, harbor seals, baitfish spawning beaches, shellfish, and Sequim Bay State Park.
STR-41	New strategy 1/02	Discovery Bay - General strategy for the entire bay. 48º-3.00'N 122º-51.50'W	Exclusion/ Deflection/ Collection - Protect beaches throughout the bay.	3000'	Based on trajectories, deploy boom to protect as much of the shoreline in the bay as possible that is expected to be impacted. All beaches in the bay have high resource value.	Stage from Contractors Point in Discovery Bay (JEF0720), or from a small ramp north of Gardiner (JEF0729).	By boat from the John Wayne Marina in Sequim Bay, or from Port Townsend. Vehicle access from Highway 101 near Gardiner.	All beaches in the bay are baitfish spawning habitat, shellfish.

4.3.2 Proposed Booming and Collection Strategies: Matrices

Strategy	Status	Location	Response Strategy	Length of Boom	Strategy Implementation	Staging Area	Site Access	Resources Protected
STR-42		Port Discovery JEF0700 47º-59.820'N 122º-52.475'W	Exclusion - Keep oil out of Port Discovery.	2000'	Deploy boom across the narrowest part of the entrance to Port Discovery. Port Discovery becomes a mudflat at low tide. Deploy boom along the eastern edge of the mudflat so the boom remains in water at low tide.	Stage from Contractors Point in Discovery Bay (JEF0720), or from a small ramp north of Gardiner (JEF0729).	By boat from the John Wayne Marina in Sequim Bay, or from Port Townsend. Vehicle access from Highway 101 in Port Discovery.	Mudflat and marsh habitat, shellfish, salmon, and waterfowl.